

Factoring: re-writing an expression as the product of its factors

Types of Factoring:

Greatest Common Factoring

Grouping (with 4 terms)

Trinomials (also using Grouping)

Perfect Squares

Difference of Squares

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GCF (Greatest Common Factor)

- find the biggest term that divides evenly into each term

- GCF is a monomial

- Answer: monomial * polynomial

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Factoring by GCF:

1. $6x^2 - 12x$

GCF = $6x$

$6x(x - 2)$

2. $6a^3 + 9a^2 + 3a$

GCF = $3a$

$3a(2a^2 + 3a + 1)$

3. $2a^2bc^5 + 8a^6b^3c^2 - 2a^3b^6c^5d$

$\frac{2a^2bc^2}{GCF} (c^3 + 4a^4b^2 - ab^5c^3d)$

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4. $2x^3 + 4x^2 - 2x$
 $GCF = 2x$
 $2x(x^2 + 2x - 1)$
 $\frac{2x^3}{2x} + \frac{4x^2}{2x} - \frac{2x}{2x}$
 $\frac{36by^5}{4by^3} - \frac{56b^2y^3z}{4by^3}$
 $GCF = 4by^3$
 $\frac{9by^2}{by^2} - \frac{14b^2yz}{by^2}$
 $= 9y^2 - 14b^2z$
 $4by^3(9y^2 - 14b^2z)$

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You try!

1. $6x + 3 = 3(2x + 1)$

2. $24x^2 - 8x = 8x(3x - 1)$

3. $10x^2y - 15xy^2$ GCF: $5xy$

4. $3n^3 - 12n^2 - 30n = 3n(n^2 - 4n - 10)$

5. $18m^2n^4 - 12m^2n^3 + 24m^2n^2$
 $5xy(2x - 3y)$

$6m^2n^2(3n^2 - 2n + 4)$

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Grouping

-we can do this when we have 4 terms

-Answer: binomial * binomial

$\downarrow$
 $2 \text{ terms} \times 2 \text{ terms}$
 $= 4 \text{ terms}$
 $(a + b)(a + b) = a^2 + ab + ab + b^2$

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Factoring by Grouping:

1.) $3ac - 15ad + 2bc - 10bd$

$$3a(c - 5d) + 2b(c - 5d)$$

2.) $x^3 + 2x^2 - 5x - 10$

$$x^2(x + 2) - 5(x + 2)$$

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3.) $xz + 12w + 2wz + 6x$

$$xz + 6x + 12w + 2wz$$

$$x(z + 6) + 2w(6 + z)$$

4.) $9abc - 9bc + 5ad - 5d$

$$(6 + z)(2w + x)$$

$$9bc(a - 1) + 5d(a - 1)$$

$$(a - 1)(9bc + 5d)$$

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You try!

1. $6b^3 + 8b^2 + 9b + 12$

2. $4r^3 + 6r + 4r^2 + 6$

3. $2x^3 - 12x^2 + 18 - 3x$

4. $15x^2 - 10x^3 + 8x - 12$

5. $8y - 8 - x + xy$

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